

WHAT IS CLAIMED IS:

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1. An image processing apparatus for synthesizing a source image and a target image by positioning the target image in a designated synthesis area in the source image, comprising:

10 a search part searching coded data of the source image per predetermined independently processable block for an objective block corresponding to the designated synthesis area; and

an objective block synthesis part synthesizing
15 detected coded data of the objective block of the source image and coded data of the objective block of the target image,

wherein the coded data are encoded in accordance with a JPEG 2000 standard.

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2. The image processing apparatus as claimed
25 in claim 1, wherein the objective block synthesis part

comprises a coded data replacement part replacing the coded data of the objective block of the source image with the coded data of the objective block of the target image.

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3. The image processing apparatus as claimed
10 in claim 1, further comprising:

an encoder encoding image data into coded data by performing two-dimensional wavelet transform, quantization and encoding on the image data in accordance with the JPEG 2000 standard; and

15 a decoder decoding the coded data into the image data by performing inverse two-dimensional wavelet transform, dequantization and decoding on the coded data in accordance with the JPEG 2000 standard.

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4. The image processing apparatus as claimed
in claim 3, wherein the objective block synthesis part
25 comprises:

an objective image reconstruction part using
the decoding part to decode the coded data of the
objective block of the source image into image data of
the objective block of the source image and the coded
5 data of the objective block of the target image into
image data of the objective block of the target image;

an objective image synthesis part synthesizing
the decoded image data of the objective block of the
source image and the decoded image data of the objective
10 block of the target image; and

an objective image re-encoding part using the
encoding part to encode the synthesized image data of
the objective block into synthesized coded data again
and replacing the original coded data of the objective
15 block of the source image with the synthesized coded
data.

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5. The image processing apparatus as claimed
in claim 3, wherein the objective block synthesis part
comprises:

an objective wavelet coefficient
25 reconstruction part using the decoding part to perform

the two-dimensional wavelet transform on the coded data of the objective block of the source image and the coded data of the objective block of the target image, thereby reconstructing a wavelet coefficient of the objective
5 block of the source image and a wavelet coefficient of the objective block of the target image;

an objective wavelet coefficient synthesis part synthesizing the reconstructed wavelet coefficient of the objective block of the source image and the
10 reconstructed wavelet coefficient of the objective block of the target image: and

an objective wavelet coefficient re-encoding part using the encoding part to encode the synthesized wavelet coefficient of the objective block into
15 synthesized coded data again and replacing the original coded data of the objective block of the source image with the synthesized coded data.

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6. The image processing apparatus as claimed in claim 1, wherein the block comprises a tile having header information.

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7. The image processing apparatus as claimed
5 in claim 1, wherein the block comprises a precinct.

10 8. The image processing apparatus as claimed
in claim 1, wherein the block comprises a codeblock.

15 9. The image processing apparatus as claimed
in claim 3, wherein the objective block synthesis part,
when at least one of the source image and the target
image is a color image, comprises a color image
20 processing part providing weights to a luminance signal
component and a color difference signal component of the
source image so that a luminance signal component of a
synthesized image has a smaller quantization step size
than a color difference signal component thereof does.

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10. The image processing apparatus as claimed
5 in claim 1, further comprising an output part outputting
synthesized coded data to an exterior thereof.

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11. An image reading apparatus, comprising:
a photoelectric conversion element reading an
image and generating image data from the image;
a coding part encoding the image data into
15 coded data and decoding the coded data into the image
data in accordance with a JPEG 2000 standard;
a storage part maintaining coded data; and
an image processing apparatus for synthesizing
a source image and a target image by positioning the
20 target image in a designated synthesis area in the
source image, comprising: a search part searching coded
data of the source image per predetermined independently
processable block for an objective block corresponding
to the designated synthesis area; and an objective block
25 synthesis part synthesizing detected coded data of the

objective block of the source image and coded data of
the objective block of the target image,

wherein the storage part maintains at least
one of coded data encoded from the source image and
5 coded data encoded from the target image.

10 12. An image forming apparatus, comprising:
an image reading apparatus, comprising: a
photoelectric conversion element reading an image and
generating image data from the image; a coding part
encoding the image data into coded data and decoding the
15 coded data into the image data in accordance with a JPEG
2000 standard; a storage part maintaining coded data;
and an image processing apparatus for synthesizing a
source image and a target image by positioning the
target image in a designated synthesis area in the
20 source image, comprising: a search part searching coded
data of the source image per predetermined independently
processable block for an objective block corresponding
to the designated synthesis area; and an objective block
synthesis part synthesizing detected coded data of the
25 objective block of the source image and coded data of

the objective block of the target image, wherein the storage part maintains at least one of coded data encoded from a source image and coded data encoded from a target image; and

5 a printer engine forming an image on a paper based on image data decoded from output coded data of the image reading apparatus by the coding part.

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13. A computer-readable recording medium for storing a program to cause a computer of an image processing apparatus to execute a procedure of
15 processing an image wherein the image processing apparatus is for synthesizing a source image and a target image by positioning the target image in a designated synthesis area in the source image, the procedure comprising:

20 a search function searching coded data of the source image per predetermined independently processable block for an objective block corresponding to the designated synthesis area; and

 an objective block synthesis function
25 synthesizing detected coded data of the objective block

of the source image and coded data of the objective
block of the target image,

wherein the coded data are encoded in
accordance with a JPEG 2000 standard.

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14. The computer-readable recording medium as
10 claimed in claim 13, wherein the objective block
synthesis function comprises a coded data replacement
function replacing the coded data of the objective block
of the source image with the coded data of the objective
block of the target image.

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15. The computer-readable recording medium as
20 claimed in claim 13, the procedure further comprising:

an encoding function encoding image data into
coded data by performing two-dimensional wavelet
transform, quantization and encoding on the image data
in accordance with the JPEG 2000 standard; and

25 a decoding function decoding the coded data

into the image data by performing inverse two-dimensional wavelet transform, dequantization and decoding on the coded data in accordance with the JPEG 2000 standard.

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16. The computer-readable recording medium as
10 claimed in claim 15, wherein the objective block synthesis function comprises:

an objective image reconstruction function
using the decoding function to decode the coded data of
the objective block of the source image into image data
15 of the objective block of the source image and the coded
data of the objective block of the target image into
image data of the objective block of the target image;

an objective image synthesis function
synthesizing the decoded image data of the objective
20 block of the source image and the decoded image data of
the objective block of the target image; and

an objective image re-encoding function using
the encoding function to encode the synthesized image
data of the block into synthesized coded data again and
25 replacing the coded data of the block of the source

image with the synthesized coded data.

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17. The computer-readable recording medium as claimed in claim 15, wherein the objective block synthesis function comprises:

an objective wavelet coefficient

10 reconstruction function using the decoding function to perform the two-dimensional wavelet transform on the coded data of the objective block of the source image and the coded data of the objective block of the target image, thereby reconstructing a wavelet coefficient of
15 the objective block of the source image and a wavelet coefficient of the objective block of the target image;

an objective wavelet coefficient synthesis function synthesizing the reconstructed wavelet coefficient of the objective block of the source image
20 and the reconstructed wavelet coefficient of the objective block of the target image: and

an objective wavelet coefficient re-encoding function using the encoding function to encode the synthesized wavelet coefficient of the block into
25 synthesized coded data again and replacing the coded

data of the block of the source image with the
synthesized coded data.

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18. The computer-readable recording medium as
claimed in claim 13, wherein the block comprises a tile
having header information.

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19. The computer-readable recording medium as
15 claimed in claim 13, wherein the block comprises a
precinct.

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20. The computer-readable recording medium as
claimed in claim 13, wherein the block comprises a
codeblock.

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21. The computer-readable recording medium as
claimed in claim 15, wherein the objective block
5 synthesis function, when at least one of the source
image and the target image is a color image, comprises a
color image processing function providing weights to a
luminance signal component and a color difference signal
component of the source image so that a luminance signal
10 component of a synthesized image has a smaller
quantization step size than a color difference signal
component thereof does.